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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/768,940	01/30/2004	Kei Arao	51890	7175

7590 12/14/2004  
EDWARDS & ANGELL, LLP  
P.O. Box 55874  
Boston, MA 02205

EXAMINER

WALKE, AMANDA C

ART UNIT	PAPER NUMBER
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1752

DATE MAILED: 12/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/768,940

Applicant(s)

ARAO ET AL.

Examiner

Amanda C Walke

Art Unit

1752

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 30 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Daniels et al (5,312,715).

Daniels et al disclose a photoimageable composition and process for use of the same.

The composition comprises a binder that is a mixture of a phenolic resin and a multifunctional epoxy or vinyl ether pound and a curing system comprising a photoactive compound capable of generating a curing catalyst capable of crosslinking the binder components. The process for use of the composition comprises application of the composition to a substrate, drying of the same, exposing the dried coating to activating radiation, curing the binder in light exposed areas, developing the coating and thermally curing the developed image. The composition is especially useful as a solder mask. The photoimageable composition of the invention comprises a binder that is a mixture comprising an alkali soluble phenolic resin and a compound containing at least two active groups selected from epoxy groups, vinyl ether groups and mixtures of the two, a photoactive compound that liberates a curing catalyst for binder components in imaged areas upon patterned exposure to activating radiation, and a crosslinking agent for the phenolic resin component of the binder that is activated in the presence of a photogenerated curing catalyst. In a

Art Unit: 1752

preferred embodiment of the invention, the primary components of the binder comprise a poly(vinyl phenol) and an epoxy resin.

Given the teachings of the reference, the instant claims 1 and 4 are anticipated by Daniels et al.

***Claim Rejections - 35 USC § 103***

3. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yezrielev et al (5,334,671) in view of Daniels et al (5,312,715).

Yezrielev et al disclose a phenol-terminated diester compositions which may be liquids or solids and crosslinkable formulations containing a mixture of the phenol terminated diesters and an amino crosslinking agent. The phenol terminated diester compositions of this invention may be used as a resinous component in curable coating and paint formulations, also containing an amino crosslinking agent and other optional ingredients such as crosslinking catalyst, fillers, pigments and the like. Coatings prepared in accordance with this invention exhibit both high hardness and high impact strength, excellent weatherability, good corrosion resistance and hydrolytic stability, good solvent resistance and adhesion as well as low color and low impurity levels. These properties are produced without the incorporation of L.C. polymers or mesogenic groups into the composition, thus avoiding the many drawbacks of L.C. based polymers or polymer compositions.

The phenol terminated diester polymer compositions of this invention contain no liquid-crystalline polymers or mesogenic groups, and may be further characterized as having glass transition temperatures (T<sub>g</sub>) as low as -40.degree. C. for the lower viscosity polymers and up to +100.degree. C. or more for the viscous or solid polymers. These polymers may be converted

into a formulated coating by adding an amino crosslinking agent and the usual solvents, pigments, and additives such as flow modifiers and stabilizers which are employed in coating compositions. The formulated coating may be applied to a substrate in the usual manner, e.g., by brushing, spraying, roller coating, or dipping. The coated substrate is then baked to form the final film by simultaneously evaporating off the solvent followed by crosslinking. The films of the invention are characterized by improved properties such simultaneous high hardness and high impact resistance, excellent weatherability, good corrosion resistance and hydrolytic stability, good solvent resistance, low impurity levels, and good adhesion when compared with films made with similar (molecular weight, functionality, etc.) polymeric materials containing no phenol terminal groups.

The diphenols which may be connected by an ester linkage to the terminal carboxyl or carbonate groups present in the backbone material are aromatic compounds having hydroxy substituent groups attached directly to the aromatic ring. As indicated above, the phenol terminated diesters of the present invention are particularly useful as resinous components in crosslinkable paint and coating compositions also containing an amino crosslinking agent, and other conventional additives normally present in such compositions. As described above, the formulations of this invention are characterized by improved weather resistance. However, additional improvements in this and other properties can be achieved by including stabilizers and stabilizing systems into the formulation. Among compounds providing improvements in weather resistance are HALS (hindered amine light stabilizers), UV-screensers, antioxidants, etc. To achieve the desired color, the composition can be formulated with one or a mixture of various pigments. If pigment is added to the coating formulation, then the ratio of pigment to diester and

Art Unit: 1752

amino crosslinking agent desirably ranges from about 0.5 : 1.0 to 5.0 : 1.0, preferably from about 0.8 : 1.0 : to 2.0 : 1.0.

Another formulating tool to improve weather resistance are silicone resins used to replace part of the diester component of the composition and impart better weather resistance to the whole system. All of these formulating approaches can be used with the diester compositions of the present invention.

The diester composition of this invention may also be blended with other crosslinkable polymer materials to improve the physical and chemical properties of the latter. Examples of suitable blend polymers include acrylic and methacrylic polymers and copolymers, epoxy resins, alkyd resins, epoxy/phenolic resins, epoxy/acrylic resins, aromatic and aliphatic urethane polymers, chlorinated rubber, nitrocellulose and other polyester resins. Respective blend ratios of 1:20 to 20:1 may be used. The diesters of this invention are particularly effective in improving the chemical resistance of alkyd resins when blended therewith at levels of from about 5 to 25% by weight. According to the instant claim 2, the polymer preferably comprises a bisphenylene.

While the reference teaches that the novel resin may be combined with polymers such as acrylic and methacrylic polymers and copolymers, epoxy resins, alkyd resins, epoxy/phenolic resins, epoxy/acrylic resins, aromatic and aliphatic urethane polymers, chlorinated rubber, nitrocellulose and other polyester resins, the reference fails to specifically teach a polyvinyl phenol resin.

Daniels et al has been discussed above and teaches a photoimageable composition comprising a poly(vinyl phenol) and an epoxy resin as a known and useful resin that allows for high resolution patterns.

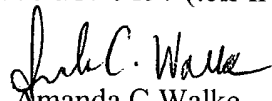
Art Unit: 1752

Given the teachings of the references, it would have been obvious to one of ordinary skill in the art to prepare the material of Yezrielev et al choosing to employ the blend polymer of Daniels et al to increase the resolution of the pattern, with reasonable expectation of achieving a material having improved coating properties.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amanda C Walke whose telephone number is 571-272-1337. The examiner can normally be reached on M-R 5:30-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Amanda C Walke  
Examiner  
Art Unit 1752

ACW  
December 13, 2004